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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,944	07/21/2003	Jianfeng Chen	04577/000N072-US0	7694
7278	7590	02/19/2008		
DARBY & DARBY P.C. P.O. BOX 770 Church Street Station New York, NY 10008-0770			EXAMINER WARTALOWICZ, PAUL A	
			ART UNIT 1793	PAPER NUMBER
			MAIL DATE 02/19/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/624,944	Applicant(s) CHEN ET AL.	
	Examiner PAUL A. WARTALOWICZ	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-7 and 9-12 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-7 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uedaira et al. (U.S. 4520004) in view of Guo et al. (U.S. 6827916) and Vita et al. (U.S. 2985506).

Uedaira et al. teach a process for making barium titanates wherein barium chloride and titanium tetrachloride are mixed in a suspension of pH 13.5 or above, adjusted by KOH, NaOH, etc., and the Ba/Ti ratio is 0.7-5 (col. 4) wherein the reaction

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temperature is 60°C and then the reaction product is filtered and dried to produce barium titanate (col. 5).

Uedaira et al. does not teach rinsing the product with deionized water, however one of ordinary skill in the art would use deionized water because the benefits of deionized water are well known to practitioners in the art.

As to the limitations wherein the concentration of metal ions ($\text{Ba}^{2+} + \text{Ti}^{4+}$) ranges from 0.1 to 2.0 mol/L and wherein the base concentration in the solution (II) ranges from 3 to 15 mol/L and wherein the flow rates of the solutions range from 5 to 300L/h and the flow rate ratios of the solutions range from 0.5 to 10, Vita teaches a process for producing barium titanate particles (col. 1, lines 18-20) wherein the rate of flow and concentration of the solution is varied for the purpose of controlling the crystal form and particle size of the barium titanate crystals (col. 2, lines 55-60).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the rate of flow and concentration of the solution, since it has been held that discovering an optimum value or a result effective variable involved only routine skill in the art. In re Boesch, 617 F.2nd 272, 205 USPQ 215 (CCPA 1980). The artisan would have been motivated to vary the rate of flow and concentration of the solution by the reasoned explanation that varying the rate of flow and the concentration in order to control the crystal form and particle size of the barium titanate crystals as taught by Vita.

From this disclosure, it would be obvious to optimize the flow rates of the reactants, including the alkali solution (hydroxide ions), of Harada et al.

As to the limitation wherein the reaction takes place in a high-gravity reactor, Guo et al. teach a process for producing a fine powder (col. 1, lines 11-14) wherein reactions take place in a high-gravity reactor such that the centrifugal acceleration is 20-40000 m/s^2 (20-40000 m/s^2 is within the range of 1.25G to 12500 G, col. 4, lines 10-13) for the purpose of driving the reaction to completion (col. 6, lines 5-10).

Therefore, it would have been obvious to one of ordinary skill in the art to provide wherein reactions take place in a high-gravity reactor such that the centrifugal acceleration is 20-40000 m/s^2 (20-40000 m/s^2 is within the range of 1.25G to 12500 G) in Harada et al. in order to drive the reaction to completion as taught by Guo et al.

As to the limitation wherein the ceramic exhibits uniform microstructures, uniform particle size, homogenous chemical compositions, small grain sizes, and a dielectric constant of up to 2500, Harada et al. teach the afore mentioned process for producing barium titanate wherein the process meets the limitations of the claimed process such that the barium titanate of Harada et al. has the same properties of the claimed invention such as wherein the ceramic exhibits uniform microstructures, uniform particle size, homogenous chemical compositions, small grain sizes, and a dielectric constant of up to 2500 and inherently teaches the afore mentioned properties.

Claims 1-7, and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (U.S. 2002/0090335) in view of Guo et al. (U.S. 6827916) and Vita et al. (U.S. 2985506) and either one of Uedaira et al. (U.S. 4520004) or Woditsch et al. (U.S. 4173485).

Harada et al. teach a process for producing a dielectric material (paragraph 0035, lines 1-3) comprising spherical barium titanate particles wherein the Ba/Ti ratio is greater than one (paragraph 0001, lines 1-6) wherein the particles are sintered into a ceramic body (particles are barium titanate which are homogenous, paragraph 0055, lines 1-4) wherein the barium titanate is produced by mixing titanium tetrachloride (paragraph 0068, lines 3-5) with barium chloride or barium nitrate (paragraph 0071, lines 1-4) wherein the barium chloride or barium nitrate is introduced with an aqueous alkali solution (paragraph 0071, lines 4-6) such as sodium hydroxide, potassium hydroxide or ammonia water (paragraph 0069, lines 1-3) and the afore reactants mixed to produce a reaction solution is aged at a temperature of 40 to 100°C (aging is equivalent to preheating, paragraph 0076, lines 3-7) and then subjecting the reaction solution to hydrothermal treatment at a temperature of from 100 to 350°C (paragraph 0079, lines 1-4) wherein the particles obtained are filtered (paragraph 0112, lines 14-15) then washed with water and dried (paragraph 0080, lines 1-3).

Harada fail to teach that the amount of OH⁻ is constant.

Woditsch et al., however, teach a process for making alkaline earth titanates (col. 1) wherein precipitating hydroxides at a constant pH value for the purpose of obtaining commercially possible reactive hydroxides from alkaline earth metal hydroxides (col. 2).

Uedaira et al. teach a process for making barium titanate (col. 1) wherein the pH of the reaction solution is 13.5 (col. 4, 6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide a constant pH in Harada et al. because

doing so result in commercially possible reactive hydroxides and is known in the art as taught by Woditsch and Uedaira respectively.

As to the limitations wherein the concentration of metal ions ($\text{Ba}^{2+} + \text{Ti}^{4+}$) ranges from 0.1 to 2.0 mol/L and wherein the base concentration in the solution (II) ranges from 3 to 15 mol/L and wherein the flow rates of the solutions range from 5 to 300L/h and the flow rate ratios of the solutions range from 0.5 to 10, Vita teaches a process for producing barium titanate particles (col. 1, lines 18-20) wherein the rate of flow and concentration of the solution is varied for the purpose of controlling the crystal form and particle size of the barium titanate crystals (col. 2, lines 55-60).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the rate of flow and concentration of the solution, since it has been held that discovering an optimum value or a result effective variable involved only routine skill in the art. In re Boesch, 617 F.2nd 272, 205 USPQ 215 (CCPA 1980). The artisan would have been motivated to vary the rate of flow and concentration of the solution by the reasoned explanation that varying the rate of flow and the concentration in order to control the crystal form and particle size of the barium titanate crystals as taught by Vita.

From this disclosure, it would be obvious to optimize the flow rates of the reactants, including the alkali solution (hydroxide ions), of Harada et al.

As to the limitation wherein the reaction takes place in a high-gravity reactor, Guo et al. teach a process for producing a fine powder (col. 1, lines 11-14) wherein reactions take place in a high-gravity reactor such that the centrifugal acceleration is 20-40000

m/s^2 (20-40000 m/s^2 is within the range of 1.25G to 12500 G) for the purpose driving the reaction to completion (col. 6, lines 5-10).

Therefore, it would have been obvious to one of ordinary skill in the art to provide wherein reactions take place in a high-gravity reactor such that the centrifugal acceleration is 20-40000 m/s^2 (20-40000 m/s^2 is within the range of 1.25G to 12500 G) in Harada et al. in order to drive the reaction to completion as taught by Guo et al.

As to the limitation wherein the ceramic exhibits uniform microstructures, uniform particle size, homogenous chemical compositions, small grain sizes, and a dielectric constant of up to 2500, Harada et al. teach the afore mentioned process for producing barium titanate wherein the process meets the limitations of the claimed process such that the barium titanate of Harada et al. has the same properties of the claimed invention such as wherein the ceramic exhibits uniform microstructures, uniform particle size, homogenous chemical compositions, small grain sizes, and a dielectric constant of up to 2500 and inherently teaches the afore mentioned properties.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (U.S. 2002/0090335) in view of Guo et al. (U.S. 6827916) and Vita et al. (U.S. 2985506) and Kawamoto et al. (U.S. 2003/0022784).

Harada et al. teach a process for producing barium titanate as described above.

Harada et al. fail to teach the limitation wherein the Ba/Ti molar ratio is from 1.2 to 2.0.

Kawamoto et al., however, teach a process for producing barium titanate (paragraph 0003, lines 1-3) wherein the Ba/Ti molar ratio is 1.16 (paragraph 0022, lines 1-5) for the purpose of producing the desired stoichiometry of barium and titanium (paragraph 0016, lines 10-13).

The prior art range is so close that one skilled in the art would have expected it to have the same properties. *Titanium Metals Corp. v. Banner*, 227 USPQ 773.

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify the Ba/Ti molar ratio in Harada et al. in order to produce the desired stoichiometry of barium and titanium as taught by Kawamoto et al.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (U.S. 2002/0090335) in view of Guo et al. (U.S. 6827916) and Vita et al. (U.S. 2985506) and Kerchner (U.S. 6129903).

Harada et al. teach a process for producing barium titanate powders as described above.

Harada et al. fail to teach wherein the pH value of the reaction mixture is maintained constant at about 14.

Kerchner, however, teach a process for producing barium titanate powders (col. 1, lines 13-15) wherein the addition of the barium source increases the pH of the reaction mixture to about 13 (col. 5, lines 22-25) for the purpose of promoting the reaction (col. 5, lines 23-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide wherein the addition of the barium source increases the pH of the reaction mixture to about 13 in Harada et al. in order to promote the reaction as taught by Kerchner.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL A. WARTALOWICZ whose telephone number is (571)272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Paul Wartalowicz
February 11, 2008

Steven Bos
Primary Examiner
A.U. 1793

/Steven Bos/
Primary Examiner, Art Unit 1793